

REMARKS

Claims 1, 4-5, 7-25, 28-29, 21-48, 51-52, and 54-61 remain in this application with claims 1, 25 and 48 in independent form. Claims 1, 4, 7, 25, 28, 31, 48, 51, 54, and 59-61 have been amended and claims 2, 3, 6, 26, 27, 30, 49, 50, and 53 have been cancelled.

The specification stands rejected under 35 U.S.C. §132(a) because it is contended that new matter was introduced into the disclosure. Applicant has amended paragraph [0030] to be consistent in scope with the specification as originally filed. Specifically, the chain extender has a hydroxyl number of from about 448 to about 4,488 mg KOH/g.

In paragraph [0030], the chain extender is described as having a molecular weight of less than 1000, preferably from 25 to 250, and more preferably less than 100. Further, in paragraph [0031], the chain extender is described as having two isocyanate reactive groups. With knowledge of the molecular weight and the functionality for the chain extender, a person of ordinary skill in the art, relying on a well-known mathematical formulation can easily deduce the hydroxyl number that is now incorporated into the specification.

As well known to those skilled in the art, the functionality and molecular weight of a polyol can be used to determine the hydroxyl number in accordance with the following formula:

$$MolecularWeight = \frac{56,100 * f}{OH\#}$$

where f is the functionality of the polyol; and
 $OH\#$ is the hydroxyl number (mg KOH/g).

The preferred molecular weight of the chain extender is from 25 to 250. The corresponding hydroxyl numbers can be calculated using the above formula. At a molecular weight of 25 and a functionality of 2, the hydroxyl number is $(56,100 \times 2)/25$, or **4,488 mg KOH/g**. At a molecular weight of 250 and a functionality of 2, the hydroxyl number is $(56,100 \times 2)/250$, or **448.8 mg KOH/g**. Therefore, the hydroxyl number is from about **448 to about 4,488 mg KOH/g**. Applicant submits that the disclosure of the molecular weight and the functionality in the specification as originally filed fully support the hydroxyl number of from about 448 to about 4,488 mg KOH/g. Accordingly, no new matter has been introduced.

Claims 1-2, 4-26, 28-49, and 51-61 stand rejected under 35 U.S.C. §112, first paragraph. Applicant has amended claims 1, 25, and 48 to recite that the chain extender has two isocyanate-reactive groups as suggested by the Examiner. As such, the §112 rejection is believed to be overcome.

Claims 1-2, 4-26, 28-49, and 51-61 stand rejected under 35 U.S.C. §102(b) as being anticipated by Bleys (United States Patent No. 5,968,993). The Examiner states that Bleys discloses preparations of polyurethane foams prepared from isocyanates, polyols, and chain extenders and the foams having densities as claimed. Specifically, the Examiner cited Example 3 of Bleys that produces a microcellular elastomeric polyurethane foam having a density of 420 kg/m³, or 26.2 pounds per cubic foot. The Examiner also contends that even though the glass transition temperatures and tan peak deltas are not disclosed in Bleys, they are inherent owing to the similarities in the materials employed in the products.

Applicants have amended claims 1, 25, and 48 to recite that the viscoelastic foam is formed having a density of from 2.5 to 25 pounds per cubic foot. Additionally, those of ordinary skill in the art readily appreciate that microcellular elastomeric polyurethane foams do not exhibit as high of a tan delta peak as viscoelastic polyurethane foams because such elastomers do not exhibit viscoelastic characteristics. Therefore, Bleys does not disclose each and every limitation of claims 1, 25, and 48, as amended.

It is respectfully submitted that claims 1, 25, and 48, as amended, overcome the §102(b) rejection over Bleys and are believed to be allowable. Claims 4-5, 7-24, 28-29, 21-47, 51-52, and 54-61, which depend directly or indirectly from claims 1, 25, and 48, are also believed to be allowable.

Claims 1-2, 4-26, 28-49, and 51-61 stand rejected under 35 U.S.C. §102(e) as being anticipated by Hager et al. (United States Patent No. 6,391,935) and claims 1-2, 4-26, 28-49, and 51-61 stand rejected under 35 U.S.C. §102(b) as being anticipated by Lutter et al. (United States Patent No. 5,420,170). The Examiner states that both Hager et al. and Lutter et al. disclose preparations of polyurethane foams prepared from isocyanates, polyols, and chain extenders having densities claimed. The Examiner also contends that even though the glass transition temperatures and tan peak deltas are not disclosed, they are inherent owing to the similarities in the material employed in the products.

Hager et al. is directed toward a viscoelastic polyurethane foam that is able to be formulated over a broad range of processing conditions and isocyanate indices as a result of incorporating a monol. Hager et al. does disclose using a chain extender; however, the chain extender is optional and is used only in minor proportions (see col. 4, lines 60-61).

Further, each of the examples disclosed in Hager et al. employ the chain extender in minor amounts. Example 16 utilizes the chain extender in an amount of 2.0 parts by weight, Example 17 utilizes the chain extender in an amount of 1.0 parts by weight, and Example 19 utilizes the chain extender in an amount of 2.0 parts by weight.

Lutter et al. is directed toward a viscoelastic polyurethane that is used for structure-borne soundproofing. Lutter et al. does disclose using a chain extender broadly in an amount of from 1 to 60 parts by weight, preferably from 1 to 10 parts by weight (*see col. 9, lines 15-20*). In Example 3, the chain extender is ethylene glycol and is present in an amount of 2.8 parts by weight. Examples 5 to 8 use the chain extender in an amount of 6 parts by weight.

Applicant respectfully submits that neither Hager et al. or Lutter et al. disclose the claimed subject matter with sufficient specificity to constitute an anticipation under 35 U.S.C. §102. Referring to the Manual of Patent Examining Procedure (MPEP) 2131.03(II), whether or not the prior reference discloses the claimed subject matter with sufficient specificity is fact dependent. *Where the claim terms recite a property or intended use distinguishable from the prior art, an anticipation rejection may not be appropriate. See In re Pearson*, 494 F.2d 1399, 1403, 181 U.S.P.Q. 641, 644 (C.C.P.A. 1974) (explaining that “such terms must define, indirectly at least, some characteristic not found in the old composition”). See also *E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1435, 7 U.S.P.Q.2d 1129, 1133 (Fed. Cir. 1988) (noting that “[o]n occasion, particularly with polymers, structure alone may be inadequate to define the invention, making it appropriate to define the invention in part by property limitations”).

Claims 1, 25, and 48 have been amended to recite that the chain extender is used in the amount from *7 to 30 parts by weight*. Varying the amount of the chain extender allows *a glass transition temperature of the foam to be adjusted to correspond to a use temperature of the foam*. There is full support in the specification as originally filed for this amendment and no new matter is believed to be added. In other words, the viscoelastic polyurethane foams of the subject invention have a glass transition temperature that corresponds with a use temperature of the foam. As discussed in paragraphs [0013] and [0032] of the specification as originally filed, the glass transition temperature can be adjusted by adjusting the amount of the chain extender to more closely correspond with the use temperature.

Viscoelastic polyurethane foams have unique viscoelastic characteristics. As discussed in the section titled "Background of the Invention" of the specification as originally filed, viscoelastic polyurethane foams have a hard segment phase and a soft segment phase and the viscoelasticity is maximized when the soft segment phase undergoes vitrification. To date, the glass transition temperature has been modified by manipulating the structure and composition of the soft segment phase by having different isocyanate-reactive components for different glass transition temperatures.

When such viscoelastic polyurethane foams are used in a mattress or as a seat cushion, body heat from a user warms a portion of the foam, thus softening it. The result is that the cushion molds to the shape of the body part in contact with it increasing comfort and the remainder of the foam remains hard providing support. Thus, in cold climates, the use temperature is lower and therefore the glass transition temperature should be lower and vice versa when the use temperature is higher. Undesirable results

for viscoelastic polyurethane foam occur if the use temperature does not correspond with the glass transition temperature. If the use temperature is low and the glass transition temperature is high, then large amounts of heat from the user is required to soften the viscoelastic polyurethane foam. In extreme cases, such as in a very cold climate, the user may be unable to sufficiently warm the viscoelastic polyurethane foam and will be sitting on a cold, hard block of viscoelastic polyurethane foam.

The subject invention is able to adjust the glass transition temperature by adjusting the hard segment phase by incorporating the chain extender, while employing standard viscoelastic isocyanate-reactive components. Said another way, instead of developing many different isocyanate-reactive components to produce many different viscoelastic polyurethane foams each having a unique glass transition temperature, the subject invention can produce the unique glass transition temperature from the same isocyanate-reactive component by varying and adjusting the amount of the chain extender.

It is believed that Hager et al. and Lutter et al. do not disclose the claimed subject matter with sufficient specificity to constitute an anticipation for the following reasons. First, both Hager et al. and Lutter et al. do not disclose the glass transition temperature of the viscoelastic polyurethane foam. Second, neither varies or adjusts the amount of the chain extender to adjust the glass transition temperature of the viscoelastic polyurethane foam to correspond to the use temperature. Third, neither Hager et al. nor Lutter et al. disclose specific examples failing with the claimed ranges of the chain extender to provide the adjusted glass transition temperature.

Referring specifically to Hager et al., the monol is being incorporated to allow for a range of processing of the viscoelastic foam and the chain extender is being added in

minor amounts as a standard additive. Applicants are not claiming to have been the first to utilize chain extenders in viscoelastic polyurethane foams. Instead, Applicants are claiming to have been the first to utilize the chain extender in higher and various amounts to adjust the glass transition temperature to correspond with the use temperature of the viscoelastic polyurethane foam.

Referring now to Lutter et al., the viscoelastic polyurethane foam is being used for soundproofing and the glass transition temperature is not disclosed. The glass transition temperature is inconsequential when the viscoelastic polyurethane foam is used for soundproofing. Since a user is not warming the viscoelastic polyurethane foam and the viscoelastic polyurethane foam is not supporting the user, the viscoelastic characteristics of the viscoelastic polyurethane foam are not being relied upon. Lutter et al. only discloses that the viscoelastic polyurethane foam can be used within a temperature range of from -20 °C to 80 °C. Even though Lutter et al. discloses a broad range for the amount of the chain extender being used, there is no disclosure of the chain extender being used in various amounts to adjust the glass transition temperature to correspond with the use temperature.

In summary, Hager et al. does not disclose the chain extender being used in an amount of from 7 to 30 parts by weight based on the 100 parts by weight and Lutter et al. does not disclose specific examples of the chain extender falling within the claimed ranges. Further, Hager et al. and Lutter et al. do not disclose, teach, or suggest the novel and unique limitation of adjusting the amount of the chain extender to produce the viscoelastic polyurethane foam having a glass transition temperature that corresponds to the use temperature of the foam.

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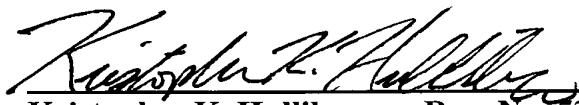
As set forth in MPEP 2131.03(II), "When the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation." Since, claims 1, 25, and 48 have been amended to recite that the chain extender is used in the amount from 7 to 30 parts by weight and specific examples falling within such a range are not disclosed in Hager et al. or Lutter et al., is it respectfully submitted that the 35 U.S.C. §102 rejections are overcome and claims 1, 25, and 28 are believed to be allowable. Claims 4-5, 7-24, 28-29, 21-47, 51-52, and 54-61, which depend directly or indirectly from claims 1, 25, and 48, are also believed to be allowable.

Accordingly, it is respectfully submitted that the Application, as amended, is now presented in condition for allowance, which allowance is respectfully solicited. Applicant believes that no fees are due, however, if any become required, the Commissioner is hereby authorized to charge any additional fees or credit any overpayments to Deposit Account 08-2789.

Respectfully submitted

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CERTIFICATE OF MAILING

I hereby certify that this **Amendment** for United States Patent Application Serial Number **10/606,825** filed **June 26, 2003** is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on **October 13, 2005**.



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